

WHAT IS CLAIMED IS:

1. A pattern inspection apparatus for inspecting a pattern to-be-inspected by comparing it with a reference pattern, said pattern inspection apparatus comprising:
- 5 storage means for storing said reference pattern;
inputting means for inputting an image of said pattern to-be-inspected;
inspecting means for inspecting said pattern to-be-inspected by comparing an edge of said inputted image of said pattern to-be-inspected and an edge of said stored reference pattern; and
- 10 outputting means for outputting a result of said inspection.
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2. The pattern inspection apparatus as claimed in claim 1, wherein said inspecting means conducts matching between said pattern image to-be-inspected and said reference pattern by comparing the edge of said pattern image
- 20 to-be-inspected and the edge of said reference pattern.
3. The pattern inspection apparatus as claimed in claim 2, wherein said matching is conducted by dilating the edge of said pattern image to-be-inspected.
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4. The pattern inspection apparatus as claimed in claim 2, wherein said matching is conducted by dilating the edge

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of said reference pattern.

5. The pattern inspection apparatus as claimed in claim 2, wherein said matching is conducted by using the total sum of products of amplitudes of the edges of said pattern image to-be-inspected and amplitudes of the edges of said reference pattern at respective pixels as an evaluation value.

6. The pattern inspection apparatus as claimed in claim 2, wherein said matching is conducted by using the total sum of inner products of edge vectors of said pattern image to-be-inspected and edge vectors of said reference pattern at respective pixels or the total sum of absolute values of said inner products as an evaluation value, wherein each of said edge vectors has a magnitude equal to amplitude of the edge and a direction identical to the direction of the edge.

7. The pattern inspection apparatus as claimed in claim 2, wherein said matching is conducted by altering a weighting for each part of said reference pattern.

8. The pattern inspection apparatus as claimed in claim 1, wherein said inspecting means assumes the correspondence of the edge of each pixel of said reference pattern to the edge of each pixel of said pattern image

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to-be-inspected.

9. The pattern inspection apparatus as claimed in claim 8, wherein said correspondence-assumption is conducted
5 considering the distance between the edge of each pixel of said reference pattern and the edge of each pixel of said pattern image to-be-inspected and the directional difference between both the edges.

10 10. The pattern inspection apparatus as claimed in claim 8, wherein said inspecting means constructs an area based on the edges of said pattern image to-be-inspected in which said inspecting means failed to assume said correspondence to the edges of said reference pattern, and recognizes said
15 area as a defective area. A

11. The pattern inspection apparatus as claimed in claim 8, wherein said inspecting means constructs an area based on the edges of said pattern image to-be-inspected in which
20 said inspecting means succeeded in assuming said correspondence to the edges of said reference pattern, detects an area whose luminance distribution is non-uniform among the areas, and determines said area as a defective area.

25 12. The pattern inspection apparatus as claimed in claim 10 or 11, wherein said inspecting means judges a defect

class based on geometrical feature quantities of said defective area.

13. The pattern inspection apparatus as claimed in claim
5 10 or 11, wherein said inspecting means judges a defect class based on a feature quantity concerning the luminance of said defective area.

14. The pattern inspection apparatus as claimed in claim
10 8, wherein said inspecting means calculates a pattern deformation quantity or pattern deformation quantities of said pattern to-be-inspected with respect to said reference pattern.

15 15. The pattern inspection apparatus as claimed in claim 14, wherein said pattern deformation quantity includes at least one of a displacement quantity, a magnification variation quantity, and a dilation quantity of the line width.

20 16. The pattern inspection apparatus as claimed in claim 14, wherein said inspecting means adds an attribute of the pattern to said reference pattern.

25 17. The pattern inspection apparatus as claimed in claim 1, wherein said inspecting means takes a profile on said pattern image to-be-inspected, detects predetermined

points for each said profile, approximates the detected points with a curve, and assumes the curve to be an edge of said pattern image to-be-inspected.

- 5 18. A pattern inspection method for inspecting a pattern to-be-inspected by comparing it with a reference pattern, said pattern inspection method comprising:

an inputting step of inputting an image of said pattern to-be-inspected;

- 10 an inspecting step of inspecting said pattern to-be-inspected by comparing an edge of said inputted image of said pattern to-be-inspected and an edge of said reference pattern stored in storage means; and

an outputting step of outputting a result of said
15 inspection.

19. A recording medium for recording a program that makes a computer execute a pattern inspection method for inspecting a pattern to-be-inspected by comparing it with
20 a reference pattern and capable of being read by the computer, said pattern inspection method comprising:

an inputting step of inputting an image of said pattern to-be-inspected;

- an inspecting step of inspecting said pattern to-
25 be-inspected by comparing an edge of said inputted image of said pattern to-be-inspected and an edge of said reference pattern stored in storage means; and

an outputting step of outputting a result of said inspection.

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